UNITED STATES PATENT AND TRADEMARK OFFICE

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Ryan, Mason & Lewis, LLP
90 Forest Avenue
Locust Valley, NY 11560

EXAMINER
SHERMAN, STEPHEN G

ART UNIT	PAPER NUMBER
2629	

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 April 2006*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 24-33* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16 and 24-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   This office action is in response to the amendment filed the 6 April 2006. Claims

1-16 and 24-33 are pending. Claims 17-23 and 34-37 have been cancelled.

Response to Arguments

2.   Applicant's arguments with respect to claims 1-16 and 24-33 have been

considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

     1.   Determining the scope and contents of the prior art.
     2.   Ascertaining the differences between the prior art and the claims at issue.
     3.   Resolving the level of ordinary skill in the pertinent art.

> 4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

5.   Claims 1-3 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US 2004/0125147) in view of the NEC Corporation & NEC Design, Ltd. Webpage.

Regarding claim 1, Liu et al. disclose a method of providing a user interface for a computing device (Figure 1, item 301 and paragraph [0019]), comprising the steps of:

projecting a user input display from a projector of the computing device onto a surface (Figure 1, item 301 and paragraphs [0014-0015]); and

projecting a user output display from the projector of the computing device onto a surface (Figure 1, item 102 and paragraphs [0014-0015]).

Liu et al. fail to teach of a method for providing a user interface for a computing device wherein the surfaces for the user input and output display and are disposed in different planes.

The NEC Corporation & NEC Design, Ltd. Webpage teaches of a method for providing two projected displays on surfaces disposed in different planes (Pages 4-5, the P-ISM shows the ability to project a display one a surface in one plane while projecting a user input on a surface in a different plane.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the idea of projecting images in different planes as taught by The NEC Corporation & NEC Design, Ltd. Webpage with the computing

device taught by Liu et al. such that the computing device would project the user input and output displays from the projector onto two different surfaces in order to provide for an improved personal information terminal that provides the user with a standard computer setup that user's are accustomed to.

Regarding claim 2, Liu et al. and The NEC Corporation & NEC Design, Ltd. Webpage disclose the method of claim 1.

Liu et al. also disclose wherein the computing device is a pervasive computing device (Paragraph [0021]. The examiner interprets that since it is stated that the device does not occupy space that the device would be a pervasive device.).

Regarding claim 3, Liu et al. and The NEC Corporation & NEC Design, Ltd. Webpage disclose the method of claim 1.

Liu et al. also disclose wherein the user input display and the user output display are originally projected as a single image from a single projector (Paragraph [0015] reveals that the display and keyboard image are generated by a single projector, laser emitter 201 shown in Figure 2. The examiner interprets that since only the laser emitter 201 generates the image that the keyboard and display would be generated as a single image.).

Regarding claim 9, Liu et al. and The NEC Corporation & NEC Design, Ltd. Webpage disclose the method of in claim 1.

The NEC Corporation & NEC Design, Ltd. Webpage also discloses a method wherein the first surface is in a plane disposed in front of the computing device, the second surface is in a plane disposed behind the computing device, and the second surface is orthogonal to the first surface (Pages 4-5, the P-ISM projects the user input keyboard onto the surface in front of the device and the user output display behind the device with the two surfaces being orthogonal, as shown in the pictures.).

Regarding claim 10, Liu et al. and The NEC Corporation & NEC Design, Ltd. Webpage disclose the method of claim 1.

Liu et al. also disclose wherein the user input display comprises an image of a keyboard (Figure 1, item 301).

Regarding claim 11, Liu et al. and The NEC Corporation & NEC Design, Ltd. Webpage disclose the method of claim 1.

The NEC Corporation & NEC Design, Ltd. Webpage also discloses to teach of a method wherein the first surface is a horizontal surface and the second surface is a vertical surface (Pages 4-5, the P-ISM projects the user input keyboard onto a horizontal surface and the user output display onto a vertical surface, as shown in the pictures.).

6.   Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu

et al. (US 2004/0125147) in view of the NEC Corporation & NEC Design, Ltd. Webpage

and further in view of Anderson (US 4,575,722).

        Regarding claim 4, Liu et al. and the NEC Corporation & NEC Design, Ltd.

Webpage disclose the method of claim 3.

        Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage fail to teach of

a method further comprising the step of reflecting a portion of the originally projected

single image with a mirror system in the computing device, which causes the splitting of

the originally projected single image into the user input display and the user output

display.

        Anderson discloses of a method comprising the step of reflecting a portion of an

originally projected single image with a mirror system, which causes the splitting of the

originally projected single image into two different displays (Figure 1, item 18 and

column 4, lines 38-48).

        Therefore it would have been obvious to "one of ordinary skill" in the art at the

time the invention was made to use mirror system taught by Anderson with the dual

image system taught by the combination of Liu et al. and the NEC Corporation & NEC

Design, Ltd. Webpage in order to simultaneously view both images on different

surfaces.

Regarding claim 5, Liu et al., the NEC Corporation & NEC Design, Ltd.

Webpage and Anderson disclose the method of claim 4.

Anderson also discloses wherein, in the step of reflecting a portion of the

originally projected single image, there is a reflected portion and an unreflected portion

of the image (Figure 1 and column 4, lines 38-48, where 40' is the reflected portion and

40" is the unreflected portion.).

Regarding claim 6, Liu et al., the NEC Corporation & NEC Design, Ltd.

Webpage and Anderson disclose the method of claim 4.

Anderson also discloses wherein the step of reflecting a portion of the originally

projected single image further comprises:

splitting a display with a first mirror of the mirror system (Figure 1, item 42 and

column 4, lines 38-48);

receiving a reflection of the display from the first mirror at a second mirror of the

mirror system (Figure 1, item 44 and column 4, lines 38-48); and

projecting the display from the second mirror to a second surface (Figure 1, item

20 and column 4, lines 38-48).

Regarding claim 7, Liu et al., the NEC Corporation & NEC Design, Ltd.

Webpage and Anderson disclose the method of claim 4.

Liu et al. also disclose wherein the step of projecting the user output display

comprises projecting a large image when a short distance exists between the device

and the surface (Figure 1, item 101 can be seen to project a large image of the output

display 102 in a relatively short distance between the device 101 and the surface.).

__Regarding claim 8__, Liu et al., the NEC Corporation & NEC Design, Ltd.

Webpage and Anderson disclose the method of claim 1.

Liu et al. does not explicitly teach of the method wherein the projector is a micro

projector. However, from paragraph [0021] the examiner understands that the device is

very small since it is said to not occupy space, such that the projecting laser emitter 201

would be a micro laser emitter.

7.   Claims 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Liu et al. (US 2004/0125147) in view of the NEC Corporation & NEC Design, Ltd.

Webpage and further in view of Rafii et al. (US 6,414,422).

__Regarding claim 12__, Liu et al. and the NEC Corporation & NEC Design, Ltd.

Webpage disclose the method of claim 1.

Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage fail to teach of

a method further comprising the step of providing audio feedback from the computing

device in response to intercepting sensors of the virtual keystroke detection system,

over a virtual key in the user input display.

Rafii et al. disclose of a method further comprising the step of providing audio

feedback from a computing device in response to intercepting sensors of a virtual

keystroke detection system, over a virtual key in a user input display (Column 6, lines

42-58).

Therefore it would have been obvious to "one of ordinary skill" in the art at the

time the invention was made to use the audio feedback method taught by Rafii et al.

with the computing device taught by the combination of Liu et al. and the NEC

Corporation & NEC Design, Ltd. Webpage in order to provide feedback to the user that

a key was pressed.

Regarding claim 13, Liu et al. and the NEC Corporation & NEC Design, Ltd.

Webpage disclose the method of claim 1.

Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage fail to teach of

a method further comprising the step of providing visual feedback on the user output

display in response to intercepting sensors of the virtual keystroke detection system,

over a virtual key of the user input display.

Rafii et al. disclose of a method further comprising the step of providing visual

feedback on a user output display in response to intercepting sensors of a virtual

keystroke detection system, over a virtual key of a user input display (Column 4, lines

34-50).

Therefore it would have been obvious to "one of ordinary skill" in the art at the

time the invention was made to use the visual feedback method taught by Rafii et al.

with the computing device taught by the combination of Liu et al. and the NEC

Corporation & NEC Design, Ltd. Webpage in order to provide feedback to the user that a key was pressed.

Regarding claim 14, Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage disclose the method of claim 1.

Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage fail to teach of a method further comprising the step of providing visual feedback on the user input display in response to intercepting sensors of the virtual keystroke detection system, over a virtual key of the user input display.

Rafii et al. disclose of a method further comprising the step of providing visual feedback on a user input display in response to intercepting sensors of a virtual keystroke detection system, over a virtual key of a user input display.

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the visual feedback method taught by Rafii et al. with the computing device taught by the combination of Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage in order to provide feedback to the user that a key was pressed.

Regarding claim 15, Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage disclose the method of claim 1.

Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage fail to teach of a method wherein the user input display comprises an image of a scratch pad.

Rafii et al. disclose of a method wherein the user input display comprises an image of a scratch pad (Column 6, lines 33-41. The examiner interprets that the scratch pad would be enabled when the control and shift keys are pressed.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the scratch pad taught by Rafii et al. with the computing device taught by the combination of Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage in order to allow for the user to draw a line, a signature, or other graphic.

Regarding claim 16, Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage disclose the method of claim 1.

Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage fail to teach wherein the user input display comprises an image of a pointing device.

Rafii et al. disclose of a method wherein the user input display comprises an image of a pointing device (Column 6, lines 33-41. The examiner interprets that the pointing device would be enabled when the control and shift keys are pressed.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the pointing device taught by Rafii et al. with the computing device taught by the combination of Liu et al. and the NEC Corporation & NEC Design, Ltd. Webpage in order to allow for the user to move a cursor around to draw a line, a signature, or other graphic.

8.   Claims 24-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Liu et al. (US 2004/0125147) in view of Anderson (US 4,575,722) and further in view of

the NEC Corporation & NEC Design, Ltd. Webpage.

Regarding claim 24, Liu et al. disclose a computing device, comprising:

a projector that projects an image (Figure 2, item 101 contains laser emitter

201.); and

wherein a projected image provides a virtual user interface for a computing

device (Figure 1, items 101, 102, and 301).

Liu et al. fail to teach of a computing device comprising: a mirror system

disposed in accordance with the projector, wherein the mirror system reflects a portion

of the image from the projector, projecting a nonreflected portion of the image to a first

surface and a reflected portion of the image to a second surface.

Anderson discloses of a device comprising:

a mirror system (Figure 1, item 18 and column 3, lines 28-39),

wherein the mirror system reflects a portion of an image from a projector (Figure

1, item 40' and column 4, lines 38-48), projecting a nonreflected portion of the image to

a first surface (Figure 1, items 40" and 20, and column 4, lines 38-48) and a reflected

portion of the image to a second surface (Figure 1, items 40' and 20, and column 4,

lines 38-48).

Therefore it would have been obvious to "one of ordinary skill" in the art at the

time the invention was made to use mirror system taught by Anderson with the

computing device taught by Liu et al. in order to simultaneously view both images on different surfaces.

Liu et al. and Anderson fail to teach that the first surface and the second surface are disposed in different planes.

The NEC Corporation & NEC Design, Ltd. Webpage discloses of a computing device comprising a projector, wherein the first surface and the second surface are disposed in different planes (Pages 4-5, the P-ISM shows the ability to project a display one a surface in one plane while projecting a user input on a surface in a different plane.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the idea of projecting images in different planes as taught by The NEC Corporation & NEC Design, Ltd. Webpage with the computing device taught by the combination of Liu et al. and Anderson, such that the computing device would project the user input and output displays from the projector onto two different surfaces using a mirror system, in order to provide for an improved personal information terminal that provides the user with a standard computer setup that user's are accustomed to.

Regarding claim 25, Liu et al., Anderson and the NEC Corporation & NEC Design, Ltd. Webpage disclose the computing device of claim 24.

Liu et al. also disclose wherein the computing device is a pervasive computing

device (Paragraph [0021]. The examiner interprets that since it is stated that the device

does not occupy space that the device would be a pervasive device.).

Regarding claim 26, Liu et al., Anderson and the NEC Corporation & NEC

Design, Ltd. Webpage disclose the computing device of claim 24.

Anderson also discloses wherein the mirror system comprises:

a first mirror that intercepts a portion of the image from the projector (Figure 1,

item 42 and column 4, lines 38-48); and

a second mirror that receives the reflected portion of the image from the first

mirror and projects the reflected portion of the image to the second surface (Figure 1,

item 44 and column 4, lines 38-48).

Regarding claim 27, Liu et al., Anderson and the NEC Corporation & NEC

Design, Ltd. Webpage disclose the computing device of claim 24.

Liu et al. does not explicitly teach of the method wherein the projector is a micro

projector. However, from paragraph [0021] the examiner understands that the device is

very small since it is said to not occupy space, such that the projecting laser emitter 201

would be a micro laser emitter.

Regarding claim 28, Liu et al., Anderson and the NEC Corporation & NEC

Design, Ltd. Webpage disclose the computing device of claim 24.

The NEC Corporation & NEC Design, Ltd. Webpage also discloses wherein a portion of the image is projected in front of the pervasive computing device between the computing device and the user (Pages 4-5 shows a portion of the image being the user input keyboard as being projected in front of the device.).

Regarding claim 29, Liu et al., Anderson and the NEC Corporation & NEC Design, Ltd. Webpage disclose the computing device of claim 24.

Liu et al., Anderson and the NEC Corporation & NEC Design, Ltd. Webpage fail to explicitly teach wherein the reflected portion of the image is projected behind the computing device. However, given the combination as presented in the rejection of claim 24, the combined system would project a portion of the image behind the device and a portion of the image in front of the image as shown on the NEC Corporation & NEC Design, Ltd. Webpage (Pages 4-5) and the portion reflected behind the device would be the user output display which would be a reflected portion of the display.

Regarding claim 30, Liu et al., Anderson and the NEC Corporation & NEC Design, Ltd. Webpage disclose the computing device of claim 24.

The NEC Corporation & NEC Design, Ltd. Webpage discloses of a device wherein a first surface is perpendicular to a second surface (Pages 4-5, the picture shows that the user input projected on the first surface which is perpendicular to the user output that is projected on a second surface.).

Regarding claim 31, Liu et al., Anderson and the NEC Corporation & NEC

Design, Ltd. Webpage disclose the computing device of claim 24.

Liu et al. also disclose wherein a portion of the projected image comprises a

virtual keyboard image (Figure 1, item 301).

Regarding claim 32, Liu et al., Anderson and the NEC Corporation & NEC

Design, Ltd. Webpage disclose the computing device of claim 24.

Liu et al. also disclose wherein a portion of the projected image comprises a user

output display (Figure 1, item 102).

9.   Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al.

(US 2004/0125147) in view of Anderson (US 4,575,722) and further in view of and the

NEC Corporation & NEC Design, Ltd. Webpage and Rafii et al. (US 6,614,422).

Regarding claim 33, Liu et al., Anderson and the NEC Corporation & NEC

Design, Ltd. Webpage disclose the computing device of claim 24.

Liu et al., Anderson and the NEC Corporation & NEC Design, Ltd. Webpage fail

to teach of the computing device further comprising a key feedback mechanism.

Rafii et al. disclose a virtual keyboard comprising a key feedback mechanism

(Column 6, 42-58. The examiner interprets that if the device can provide feedback to

the user that it would contain a feedback mechanism.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the key feedback mechanism taught by Rafii et al. with the computing device taught by the combination of Liu et al., Anderson and the NEC Corporation & NEC Design, Ltd. Webpage in order to provide feedback to the user that a key was pressed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS

13 April 2006

AMR A. AWAD
PRIMARY EXAMINER